

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

On Appeal to the Board of
Appeals and Interferences

Appellant(s) : Rolf Hartung Examiner: James W. Keenan
Serial No. : 10/030,532 Group Art Unit: 3652
Filed : May 20, 2002
Title : Handling System

<p>PRE-APPEAL BRIEF REQUEST FOR REVIEW</p>
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Commissioner for Patents
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant respectfully requests review of the more-than-twice rejection of the claims in the above-identified application, and presents the following Remarks for consideration. A Notice of Appeal is being filed with this request. Applicants request previously paid notice of appeal and appeal brief fees be applied to the present appeal. Applicant authorizes the Commissioner to charge any difference in fees now due because of the USPTO's new fee schedule to our Deposit Account No. 07-4377.

Applicant's invention relates to a vacuum processing chamber to perform processes such as vacuum soldering or wafer bumping, which processes need both vacuum and high temperatures. Preferably, the loaded wafer must be heated to the process temperature with high speed and the processed wafer must be cooled with high speed before unloading. To realize this with smallest possible process time, applicant discloses an inventive linear arrangement with a loading station, and the heating and cooling plates in the process chamber with the cooling plate in front. (The loading station and the process chamber with the two plates are disposed one behind the other parallel to the rails within a vacuum chamber.) A particular integrated wafer handling system to transport wafers in and out of the vacuum processing system quickly is disclosed

§ 112 Rejection

With respect to claim 17 line 8, applicant has previously noted the common understood English usage of "in front of". With respect to claim 17, line 10, applicant has previously noted "transverse guide" refers to transverse guide (11), which has been adequately defined in the specification and identified in the figures. However, to expedite prosecution, applicant requests Examiner's kind amendments to replace the word "front" with the word "outside," and to include the reference numeral 11 after the term "transverse guide" to avoid any confusion.

With respect to claim 17 line 11, applicant notes that the fork can move up and down relative to the mount (first degree of freedom), and back and forth with the mount (i.e., second degree of freedom). The fork and mount arrangement is configured to move said fork up/down and back/forth (i.e., to move said fork with at least two degrees of freedom) as recited in the claim). Applicant respectfully submits that the claims conform to all § 112 requirements.

§ 103(a) Rejection

Neither Parodi, Yonemuzi nor Soraoka, individually or in combination, disclose all of the elements of claim 17:

(a) an external handling device disposed in front of [“outside”] the wafer processing vacuum chamber,”

(b) an internal handling device disposed “within the vacuum chamber,” and which is coupled to the external handling device “to move said wafers from [] in front of the vacuum chamber to the said cooling plate and said heating plate in said vacuum chamber and back,”

and

(c) a [common] enclosure] surrounding “said [vacuum] chamber [which has the internal handling device] and said external handling device.”

In Parodi, heating/cooling unit 17, wafer-handling device 13 (and likewise wafer handling device 208, wafer handling robot 13, I/O cassettes 19 and 20, coating unit 21, etc.) all are inside a single atmospheric pressure system 10/coating section 11. Parodi at most teaches a configuration of internal wafer handlers in an atmospheric pressure processing chamber.

Thus, unlike applicant’s claims, Parodi does not show, teach or suggest an internal handling device disposed “within the vacuum chamber,” and which is coupled to the external handling device “to move said wafers from [] in front of the vacuum processing chamber.”

Yonemizu shows a substrate washing apparatus having a handling device with a fork and two degrees of freedom. However, Yonemizu’s wafer handling system is entirely internal to the substrate washing apparatus. (See Yonemuzi, col. 2 lines 25-29, and lines 40-44).

Like Parodi, Yonemuzi does not show, teach, or suggest an “internal handling device” disposed “within the vacuum chamber,” and which is coupled to the external handling device “to move said wafers from [] in front of the vacuum processing chamber,” as required by applicant’s claim 17.

Applicant has previously noted, like Parodi, Yonemuzi’s “washing” apparatus is an atmospheric pressure apparatus for which there is no motivation to convert to a vacuum processing environment. The use of washing liquids in Yonemuzi’s apparatus teaches away from a vacuum processing chamber.

The Office Action now cites Soraoka as an example of a vacuum processing chamber. “Soraoka shows a vacuum processing apparatus for wafers including an enclosure 100, cassette loading station 16, and internal handling device 10 and vacuum processing chambers 6, and 7.” (See Office Action, page 5 1st complete paragraph).

However, Soraoka does not overcome the deficiencies of Parodi and Yonemuzi. Applicant notes that Soraoka describes an external atmospheric loading robot 9, which moves wafers in and out of intermediary loading stations (load locks) 4 and 5. Internal handling device 10 picks up wafers from loading station 4 for vacuum processing and drops off wafers at loading station 5 after vacuum processing. (See e.g., Soraoka, Fig. 2, col. 5 line 62 - col. 6 line 23, etc.).

Thus, like Parodi and Yonemuzi, Soraoka fails to show, teach or suggest an “outside” wafer handling system to introduce wafers in a vacuum wafer processing chamber, which is further coupled to an “inside” wafer handling system to move wafers in the processing chamber.

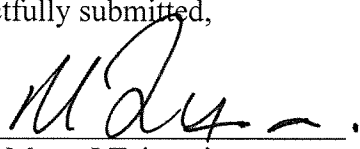
Therefore, claim 17 and its dependent claims are patentable over the combination of the cited references.

Applicant additionally notes that the Office Action (page 5, 2nd complete paragraph) mischaracterizes and misapplies known clean room technology by noting “it is extremely well known . . . to process wafers in a clean room environment” and therefore “one would surround the critical components of the system to ensure cleanliness.” Applicant notes enclosing system components may keep dirt out but does not ensure that dirt is not generated by the system components or processes themselves. In any case, cleanliness or clean room processing is not the focus of applicant’s invention or claims.

Further, the Office Action (page 6, 1st complete paragraph) confuses vacuum processing with “various types of processing, including rinsing (i.e. washing).” Applicant respectfully submits, as is well known in the art, “rinsing and washing” are atmospheric pressure processes involving water or other fluids incompatible with vacuum processing.

For at least the foregoing reasons, claim 17 is non-obvious and patentable over the combination of Parodi, Yonemuza and Soraoka.

Respectfully submitted,

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